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O B S E R V A T I O N S

O N T H E  
N A T U R E A N D P R O P E R T I E S

O F  
F I X I B L E A I R,

A N D O N T H E  
S A L U T A R Y E F F E C T S  
O F T H E  
A Q U A S A L U B R I S,

In preserving HEALTH, and preventing DISEASES.

To which are added,

STRICTURES ON the PRESENT PRACTICE of PHYSIC,  
Pointing out the CAUSES which greatly obstruct the  
IMPROVEMENT of the HEALING ART.

Submitted to the attentive Consideration of the PUBLIC.

---

By JOHN MELVILL, M. D. *R*  
JOHN-STREET, ADELPHI.

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*Hominis in nulla re Deos propriis accedunt quam salutem  
hominibus dando.*

CICERO,

*O fons blandissimè splendidior vitæ  
dulci dignus mero.*

HOR.

---

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To John Charvat Esq<sup>r</sup>  
From the Author



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## ERRATUM.

Under the article, page 72, *Stone*, instead of *and one third part of it may be administered with common water*, read, *and one third part common water, may be administered.*

# INTRODUCTION.

THE following Observations on Fixible Air, and the Artificial Mineral Water, which I think proper to distinguish by the name of *Aqua Salubris* \*, or *Salubrious Water*, have for their object the preservation of health, and the prevention of diseases, which is allowed to be the first duty of a physician; the art of curing being only the second.

“ When we consider physio, says an eloquent modern author †, as the art of sometimes prolonging life, and enabling mankind to pass the

\* This water has been hitherto called *Aqua Mephitica*, which literally signifies stinking water. The word *Mephitica*, by a figure in grammar, called Syncope, is read frequently *Mephitica*, and is derived from Memphis, the ancient name of the present city of Grand Cairo, in all ages remarkable for the offensive water with which it is surrounded. The word is used poetically—*Sæva Memphitis, Virg.*—*Sulphuriæ Memphites, Pers.*—How such an ungracious appellation came to be given to the elegant artificial mineral waters, is not easily to be conceived. I believe I shall be justified in substituting *Aqua Salubris* in its place.

† Baron Beilfield.

B

days

## ii INTRODUCTION.

days of their existence in the most perfect state of health of which their natures are capable ; it is, in these respects, a science which merits all the attention and the highest regard of mankind : it is a science which cannot be sufficiently explored."

I am aware that the best performances of this kind have met with the greatest obstruction, from the prejudices which prevail among the people in general, and too frequently among such, whose condition of life, and education, ought to have placed them above the reach of this common infirmity. But this discouragement has not been sufficient to deter me from my present undertaking ; there is reason to believe, that the great progress of the arts, the high cultivation of literature, and the consequent refinement of manners and taste, in most civilized nations, and particularly in this country, have, in a good degree, weakened the force of these prejudices, and opened a door to the favourable reception of what is now offered for the public good.

Apprehending the subject to be of a very interesting nature, and wishing it to be clearly understood by persons of every denomination,  
into



## INTRODUCTION. iii

into whose hands this publication may chance to fall, I have studied plainness and perspicuity, rather than decoration of stile, and have avoided, as much as possible, technical terms and phrases, and, where they were necessary, care has been taken to explain them.

In treating of the nature and properties of Fixible Air, I shall state with brevity a doctrine, the foundation of which was laid by the celebrated Dr. Hales, who maintains \*, that there is a principle in matter, known by the name of Fixible Air, which forming the cement, or bond of union, among the constituent particles of bodies, is to be held as the cause of firmness and cohesion in those bodies, into whose composition it enters; and is to be regarded as the sole preventive of their dissolution and decay. This doctrine has been gradually improved, and strongly supported by a great variety of well conducted experiments of some of the most distinguished philosophers and physicians of this and other countries. As Fixible Air is ascertained to be

\* That the great Sir Isaac Newton was of the same opinion of Doctor Hales, appears from a passage of his third Book of Optics. See the note in Maquer's Dictionary, under the article Putrefaction.

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the cause of firmness and the principle of health in the human body, and the great resister of putrefaction, to which it is constantly liable, and as this preserving element is attainable in the greatest perfection, the discovery made by Dr. Hales may be justly considered as the most important, respecting the health of mankind, of any yet made; and, it is but reasonable to expect, that the greatest benefits may, in process of time, be derived from a judicious direction of it by art.

Fixible Air has hitherto, by physicians, been confined to the *cure* of diseases, and has been generally administered, in a state of ebullition or efferveescence, and in many cases with surprising success. The Aqua Salubris, or Artificial Mineral Water, in which the Fixible Air is in a state of rest, has likewise been exhibited as a *medicine* only. It is my intention to consider it at present in another point of view.

After a series of accurate experiments for upwards of six years, I am the first person, at least as far as I know, who, independent of its medical virtues, has discovered it to be also, when properly combined, in the manner hereafter mentioned, the most salutary necessary

## INTRODUCTION. v

sary of life, and, at the same time, one of the most elegant luxuries, tending to preserve health, and to prevent disease, in a greater degree, than any thing yet come to our knowledge: and, what renders it still more valuable is, that every person, from the man of fortune, to the intelligent industrious artizan, may prepare it for himself, may use it in the manner hereafter prescribed, and then pronounce on the good effects of it from his own conviction.

Having committed myself thus far, in commendation of the Aqua Salubris, I think it necessary, in the subsequent pages, to inform my readers from what motives I was induced to investigate the properties, and by what steps I was led gradually to discover the virtues of this salutary water.

In submitting the following observations to the public, I do not allow myself to be deceived by the vain expectation, that this small tract will find its way into the house of every common person, like a piece of furniture. It is more than probable, that by far the greatest number of that description will never so much as hear of its existence; and of those who may chance to give it a reading, some may fail to compre-

vi INTRODUCTION.

hend it, notwithstanding its simplicity. The intelligent and discerning, therefore, of every rank, who are capable of laying aside prejudice, are the persons to whom I really address myself. From their reading and understanding the subject, from their giving the Aqua Salubris an impartial trial for their own sakes, and from their candour and humanity in communicating their experience to others, this valuable acquisition will, sooner or later, become generally known and useful.

Convinced that the use of the Aqua Salubris is very interesting to the human race in general, I trust it will not be found unworthy the consideration of the Royal Societies of these kingdoms, and the Societies instituted for similar purposes in other countries, all of them distinguished by their zeal in encouraging the advancement of true learning and useful knowledge, and in patronizing every honourable attempt to promote the general good of mankind. I trust, likewise, that those possessed of the advantages of a liberal education, the studious in every branch of literature, and the proficient in the fine arts, will find it deserving their attention, as not only promoting health, and inducing temperance,

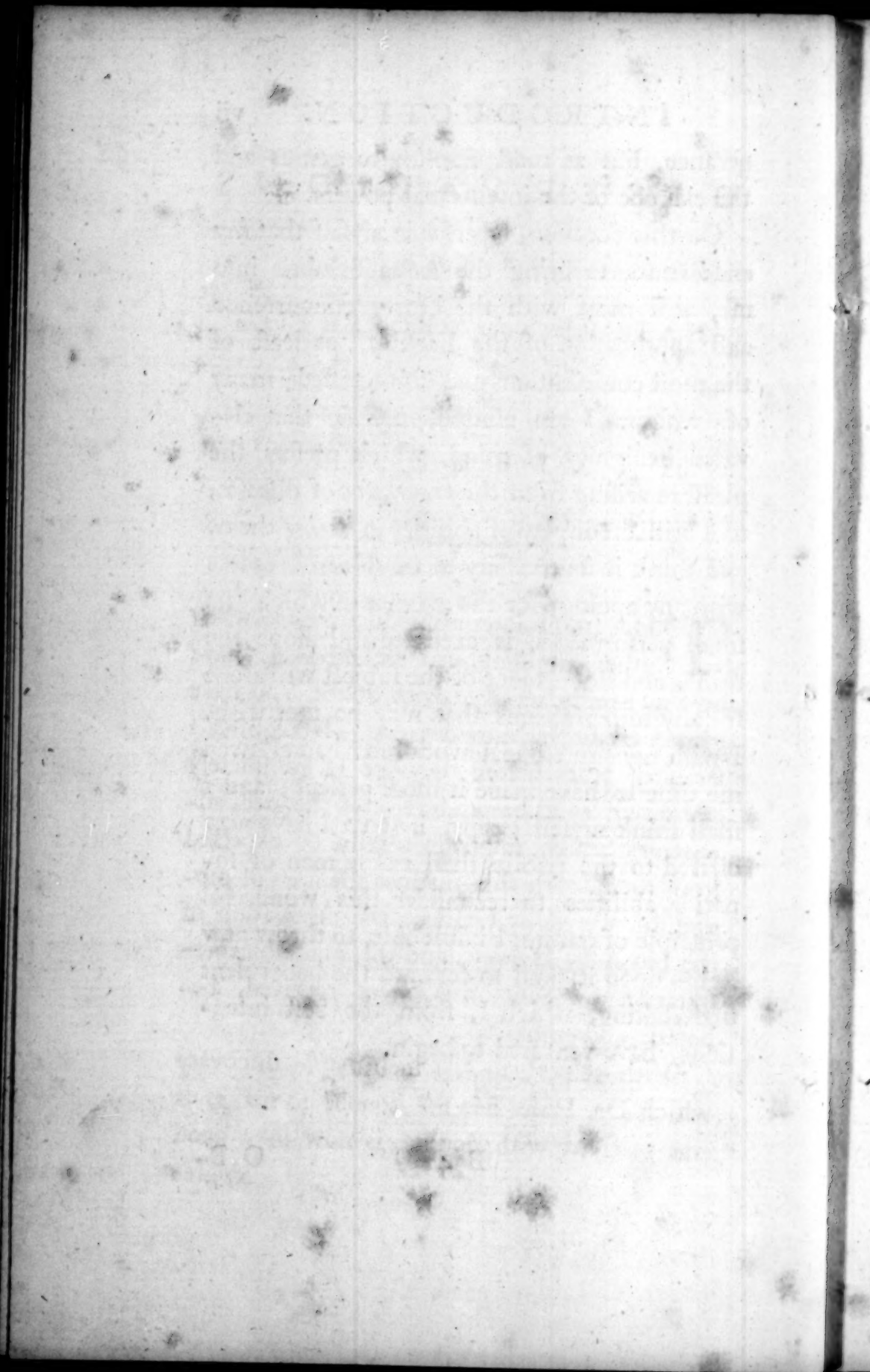


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perance, but as most friendly to genius and the exercise of the intellectual powers.

On this occasion, I persuade myself that my endeavours to bring the Aqua Salubris into use, will meet with the hearty concurrence and approbation of the Faculty, at least of the most conscientious and disinterested; many of whom, I am assured, possess that elevated benignity of mind, which prefers the pleasure arising from the *prevention* of diseases, to a brilliant display of abilities in *curing* them.

I think it unnecessary to trouble my readers with any apology for the manner in which this small performance is executed. I hope the utility and importance of the subject will atone for any imperfections that may be met with. I wish my professional avocations had allowed me time to have made it more perfect; and I shall think myself happy, if what I have now offered to the public shall excite men of superior abilities to reconsider this wonderful principle of nature, Fixible Air, to throw new lights upon it, and to forward the benevolent undertaking, which I, from the best intentions, have ventured to begin.



# OBSERVATIONS

ON THE

NATURE AND PROPERTIES

OF

FIXIBLE AIR.

---

**T**HE most interesting discoveries, whether philosophical or medical, have been generally received with doubt, and have gained credit by slow degrees. It requires a series of years before they are so completely embraced, as to be productive of the great advantages which might naturally be expected from them. In this manner the laws of motion discovered by Galileo, the circulation of the blood by Harvey, and the insensible perspiration by Sanctorius, were received, believed, and embraced.

With respect to the inestimable discovery which Dr. Hales had the honour to make, it was received with doubt, is now in a good degree

degree believed, and, I hope, the time is fast approaching, when it will be universally adopted.

About the beginning of the 17th century, Van Helmont, the most celebrated physician of his age, had the credit of being the first who observed Fixible Air in the waters of Spaw in Germany, and distinguished it by the name of *Gas Silvestre*; but his notions about it are so fanciful and erroneous, that it would be needless to quote them.

About fifty years after, Rivirius, an eminent French physician, was the first who prescribed Fixible Air, obtained from lemon juice and the salt of wormwood, in the nausea and vomitings in malignant fevers, to the great relief and refreshment of the patients. It does not, however, appear, that he attributed the happy effects to the Fixible Air, or that he was at all acquainted with the subject.

That great improver of natural knowledge, the Hon. Robert Boyle, knew that Fixible Air might be produced, by fermentation, corrosion, and dissolution of bodies, and other chymical experiments: but this philosopher seems not to have known the principal use of this air, which is so intimately mixed with,

and



and wrought into, the composition of all animal, vegetable, and mineral bodies. To the indefatigable industry, therefore, of the excellent Dr. Hales, the world is indebted for the great discovery, that Fixible Air is the elementary principle which forms the cement or bond of union among the constituent particles of bodies. It is about eighty years since that great philosopher published his curious and interesting experiments, and thereby opened a new field in natural philosophy; yet the enquiry has not been prosecuted so far as from their importance might have been expected. Except the learned physicians, Haller and M'Bride, and a modern distinguished chymist, the translator of Maquer's Dictionary, there are no writers that I know of, who have paid that attention to the discoveries of Dr. Hales which they certainly merit.

When, however, the result of the experiments of a number of the most celebrated philosophers and physicians, Boyle, Haller, Black, Pringle, M'Bride, Brownrigg, Priestley, Bewley, Dobson, and others, is duly considered, it amounts to a demonstration of Hales's doctrine to every unprejudiced enquirer.

By

By the experiments of Boyl and M<sup>r</sup>Bride, the antiseptic quality of Fixible Air, or its power of resisting putrefaction, has been clearly illustrated. Without its being extricated from a body no putrefaction can happen, and, even by the absorption of it, putrid substances may again be rendered sweet.

Mr. Bewley has ascertained it to be an acid, and that it does not in the least participate of the vegetable or mineral acids employed to procure it.

The experiments of Sir John Pringle and Dr. M<sup>r</sup>Bride (many of which I have repeated with great satisfaction) are sufficient to convince any unbiaſſed reader, that Fixible Air is liberated from our aliment in the act of digestion, which is proved to be a fermentive process \*. It is this process which brings about that new disposition and different combination in the parts of the alimentary substances, which enables the immense variety of discordant mixtures that enter into the composition of our food, to depart so far from their original na-

\* Fermentation is, by chymists, defined to be an intestine motion excited spontaneously, with the assistance of proper heat and fluidity, betwixt the integrant and constituent parts of certain compound bodies, from which result new combinations of the principles of those bodies.

tures,

tures, as to become one mild, sweet, nutritious fluid.

In order to form a more complete idea of the use of Fixible Air in the human body, it will be necessary to consider the nature of putrefaction, another great agent in the operations of nature, equally surprising and necessary with the former\*. Putrefaction is "the great process appointed by the Supreme, for the resolution of animal and vegetable substances into the elements from which they were originally formed. By this process, the oak and the bramble, the cedar and the hyssop, fruits whether delicious and nutritive, acrid or poisonous, the most beautiful of the human species, or the most deformed of the other tribes of animals, are all reduced to one common lot; nor are the elements, to which they return, to be distinguished from each other. This resolution, when philosophically considered, is equally wonderful with their formation, and is alike governed by re-

\* Putrefaction is, by chymists, defined to be an intestine motion or fermentation, excited in the proximate principles of animal and vegetable substances, by which a decomposition and total change of the nature of those principles are produced.

MAQUER.

gular

gular and invariable laws. Every seed produces its own plant, and every animal its own species; they live, they are nourished, and each retains its individual nature; they die, they decay, and return to their elementary state, and are again employed, as the constituent parts of other animals, and vegetables. Such, with respect to the material part of the creation, is the amazing circle of life and death, in which nature keeps her steady rounds, and moves by laws, fixed by the Almighty \*."

It appears then, at this day, from the most accurate and convincing experiments, that Fixible Air is a primary element, a permanently elastic, unflammable, acid *fluid*, or *vapour*, very much resembling common air, but specifically heavier, and visible, ordained to be the cause of the cohesion and firmness of the fibres, and the sustaining, animating, and invigorating principle of health and strength of the human body, and from its great antiseptic power, opposed to, and ordained to resist, the process of putrefaction, which is to resolve it into its original elements as soon as it

\* Dobson.



shall have answered the purposes of its formation. It pervades and keeps in sweetness the air in which we breathe, and all our aliment, whether solid or fluid; without it the most delicious wines become vapid, and animal and vegetable substances unfit for use. It is capable of being greatly condensed by cold, which considerably encreases its virtue. With this description of the nature and properties of Fixible Air I wish to impress the minds of my readers, especially those who either have not time or inclination, or who may not, perhaps, be altogether qualified to study philosophical subjects. As to those who wish to be more particularly informed of the experiments upon which the foregoing definition is founded, I shall refer them to the works of the authors already quoted, in the perusal of which they will find equal pleasure and conviction. A recital of those experiments would have swelled this publication beyond the limits prescribed, and would have been read and understood only by *the few*, who are pleased with such subjects.

Of

*Of the Use of the AQUA SALUBRIS, or ARTIFICIAL MINERAL WATER, in preserving Health and preventing Diseases.*

Before I enter upon this part of my subject, I think it incumbent on me to inform my readers, from what motives I was induced to investigate the properties, and by what steps I was led gradually to discover the virtues of this salutary water. In the year 1773, I was attacked with a severe rheumatism, which continued about four months. During most of the time I was confined to my room, unable to walk, but with the greatest pain, and my left arm was so much contracted and debilitated, as to be almost useless. Soon after, I embarked for the West-Indies, where the warmth of the climate, and suitable remedies, relieved my pains, and my arm became almost straight. In the Summer of 1777, I returned to England. In the month of November I was again afflicted with my former complaint, and the contraction of my arm encreased. Resolved, if possible, to subdue so painful a disease, I had recourse to the most effectual medicines, from which I received considerable benefit, as I had formerly done; but my  
arm

arm was never quite free from pain, and the contraction still remained.

In the fall of the year 1779, I was brought almost to the point of death, by a complaint in my lungs, accompanied with a spitting of blood, and other dangerous symptoms, which, in the following summer, yielded to a strict regimen and proper remedies, but left me subject, at times, to a spasmodic asthma. In the two following years, I had frequent returns of the rheumatism, particularly in the fall of the year 1782, with greater severity than usual, accompanied with gravel and bloody urine. The very unpleasant prospect, which now presented itself, of passing the remainder of my days in pain, urged me to consider my complaint with particular attention. Observing my remedies had only afforded me a temporary relief for a course of years, I began to suspect I had placed too great confidence in medicine. Among other remedies I had been in the habit of using, *were the solutions of the salt of wormwood, and salt of tartar, charged with Fixible Air*, which were continued for some time with advantage, after severer remedies had done their office. I observed, that in a week or two, after they were

discontinued, my pains invariably returned with more or less violence. I was at the same time convinced, that the *Fixible Air* was the efficient ingredients in these solutions, as, without it, they had no good effect whatever. From an early period of my life, *I had been persuaded of the truth of the doctrine established by the celebrated Dr. Hales; and had ever been of opinion, that it had not been sufficiently attended to.* Hence, on this occasion, I was led to re-consider the experiments upon which it was founded, with those of *Haller, Pringle, Black, M<sup>c</sup>Bride, &c.* many of which I repeated, to my entire satisfaction, and, under the most perfect conviction, concluded, *that the rheumatism, gout, gravel, stone, scurvy, and many other chronic complaints, so called from their long continuance, as also many other acute diseases, were occasioned by the deficiency of the Fixible Air in the system, which being extremely volatile, easily makes its escape, and thereby leaves the saline, oily, inflammable, earthy, and watery particles to act upon each other, in proportion to their attractive and repulsive powers, and thereby form new combinations productive of these complaints.*

Hitherto,



Hitherto, as I have already observed, I had received temporary relief from the solution of the salt of wormwood, charged with *Fixible Air*, after the use of severer medicines; but being unable, as well as unwilling, to live entirely on medicine, I conceived a drink might be contrived for common use, charged with *Fixible Air*, agreeable to the taste, and at the same time capable of preventing the accumulation of that morbid matter which was the cause of my complaint. From these observations I was led to consider the properties of the *Aqua Salubris*, which consists of pure water impregnated with elementary air, and from which I began to cherish hopes of relief. I well knew that *pure water* had been the object of admiration in every age, on account of its various and salutary properties, so necessary to the existence of animal and vegetable life; I knew it to be the most universal solvent, and that it was the cause of fluidity in the animal juices, without which there could be no circulation, perspiration, digestion, or secretion. I was convinced, as has been already observed, that *elementary Fixible Air* was the preserving, invigorating principle of health and strength in every liv-

ing creature. From these positions I was led to draw this fair and obvious conclusion, *that a judicious combination of these two perfect elements, with a due proportion of wine or spirit, to correct its coldness on the stomach, would constitute the most congenial and salutary necessary of life, calculated to preserve the human body in health, and when weakened with sickness, to restore it to vigour*; perfectly persuaded of the truth of this deduction, my former course of medicines were again without loss of time resumed. In the space of about three weeks, my pains were greatly abated, my arm became almost straight, and my gravel entirely disappeared. In the month of January, 1783, I commenced the use of the *Aqua Salubris* combined with wine, or spirits, in the proportions hereafter mentioned, as my common drink, and with a degree of success which answered my warmest expectations. In the course of three months use of the *Aqua Salubris*, as a necessary of life, which I found more agreeable to the taste than any other kind of liquor whatsoever, my pains were entirely removed, and my arm became quite straight, and as strong as ever. From that period to the present day, I have  
not

not had the smallest symptom of the rheumatism, gravel, or bloody urine, excepting when I accidentally am seized with a severe cold, or chuse to discontinue the *Aqua Salubris*, which I have occasionally done for some time, in order to ascertain its efficacy with precision. These slight returns never fail to yield to a few doses of *the impregnated solution already mentioned*, in the course of a few days: I at the same time proceed with the *Aqua Salubris* as my common drink, which has always the same invariable effect in preventing the return of my rheumatism and gravel; and the spasmodic asthma, to which I was liable, has for these six months entirely left me.

The art of impregnating water and other liquor with *Fixible Air*, is one of the most important inventions, antient or modern, for which the world is much indebted to the ingenuity of Dr. Priestley, and also to Dr. Nooth, for his elegant glass apparatus, which is an improvement on the method proposed by Dr. Priestley. By this happy invention, we are put in possession of the *Aqua Salubris*, or *Artificial Mineral Water*, which may justly be esteemed one of the greatest blessings which

mankind have, in any age, derived from the best directed efforts of human genius. Dr. Priestley has very truly remarked, that those who have made the most important discoveries, sometimes overlook their most obvious uses; and he might have added, with equal truth, that they seldom arrive at an adequate knowledge of the extent of their value. This last remark is particularly applicable to the discovery made by Dr. Hales, and Dr. Priestley's invention. Little did the former know, when he discovered the principle of Cohesion, that at the same time he had discovered the principle of health in the human body; and the latter thought himself happy, that by means of his invention, he had found a substitute for the foreign medicinal mineral waters, which he observes are imported at a great expence. It has been my lot to discover, that the Aqua Salubris, independent of its use in medicine, from the perfection of its component parts, necessarily constitutes the basis of the most salutary congenial drink in nature, which I hope the conclusive reasons I have already adduced, confirmed by accurate experiments and facts, during the space of six years,

has



has ascertained to the satisfaction of every candid and intelligent enquirer.

*Of the Preparation of the AQUA SALUBRIS.*

The best method yet known to prepare the *Aqua Salubris*, or *Artificial Mineral Water*, is by means of *Dr. Nooth's glass apparatus*. These glasses are made very accurately, and sold by *Mr. Blades*, manufacturer to his Majesty, *Ludgate-bill*; and by *Mr. Parker*, manufacturer to the Prince, *Fleet-street*; both of whom, with *Dr. Magellan*, have made some ingenious improvements on the apparatus.

P R O C E S S.

Fill the middle glass, represented in the plate, with spring, or any other pure, wholesome, or distilled water, and join to it again the upper glass with its stopper; pour water into the bottom vessel, so as to cover the rising in the bottom; about three quarters of a pint, or a little more, will be sufficient. Fill an ounce phial with oil of vitriol, adding it to the water, in the bottom vessel, and shaking it till they are well mixed. As

heat is generated by this mixture, it will be prudent to pour in the vitriol \* by a little at a time, otherwise the bottom glass will be in danger of being broken. Put to the water and vitriol, so mixed, through a wide glass or paper funnel, about an ounce of the powder of raw marble or chalk. The funnel must be used to prevent it from touching the inside of the lower vessel; for, if that happened, it would stick so close to the neck of the middle glass, as not to admit of their being separated without breaking. - Immediately after place the middle and upper glasses joined together, in the mouth of the bottom vessel, which is ground air tight to receive it, and put the stopper into the upper glass; then all the Fixible Air, which is disengaged from the vitriolic acid and marble powder, will pass through air-holes into the neck of the middle glass, and force a quantity of water equal to its bulk into the upper vessel so as to fill it. When this is observed, the middle and upper glasses may be taken off together, and so shaken, that the water and air within them may be much agitated, by which means a

\* Any vegetable acid may be used, but the vitriolic is found the best, as being the strongest.

considerable part of the *Fixible Air* will be absorbed into the water: after they have been shaken a few minutes, loosen the upper from the middle vessel, so that the remaining water may descend into the middle glass, and that the unabSORBED air may make its escape. The upper and middle glasses being again put together, are to be replaced upon the bottom vessel, in order to continue the process as before; and after the same operation has been repeated six or seven times, the water will be, in general, sufficiently impregnated. When the effervescence ceases in the lower glass, it may be renewed by shaking it, so that the powder of marble at the bottom may be mixed with the oil of vitriol above it, and then a greater quantity of air will be disengaged. But when the effervescence cannot be renewed, by shaking the whole apparatus together, either more vitriol, or marble powder must be put in, or more water, if neither of them produce the desired effects; remembering that not more than one third, or half at most, of the quantity of vitriol or marble powder used at first, is to be added, at any one time, when it is necessary to renew the effervescence. If the apparatus is changed  
three

three times in the course of sixteen or twenty hours, the water will be sufficiently impregnated without agitation \*. The marble powder is

\* I prefer this method, as there is much less danger in bursting the glasses. Here I shall present my readers with Dr. Priestley's method, which, though not so convenient and cleanly as the glass apparatus, nevertheless may be very useful to those who cannot procure glasses, or who find them too expensive.

#### P R E P A R A T I O N .

Take a glass vessel, *a*, plate 2, fig. 1, with a pretty narrow neck, but so formed, that it will stand upright with its mouth downwards, and having filled it with water, lay a slip of clean paper or thin pasteboard upon it; then, if they be pressed close together, the vessel may be turned upside down, without danger of admitting common air into it; and when it is thus inverted, it must be placed in another vessel, in the form of a bowl or basin, *b*, with a little water in it, so much as to permit the slip of paper or pasteboard to be withdrawn, and the end of the pipe, *c*, to be introduced. This pipe must be flexible, and air tight, for which purpose it is, I believe, best made of leather, sowed with a waxed thread, in the manner used by shoemakers; into both ends of this pipe a piece of quill should be thrust, to keep them open, while one of them is introduced into a vessel of water; and the other in the bladder, *d*, to the opposite end of which is tied round a cork, which must be perforated, the hole kept open by a quill, and the cork must fit a phial, *e*, two thirds of which should be filled with chalk just covered with water. I have since, however, found



is preferable to the chalk, as it yields more *Fixible Air*, and more gradually, consequently with

found it most convenient to use a glass tube ; and to preserve the advantage which I had, of agitating the vessel, *f*, I have two bladders communicating by a perforated cork, to which they are both tied, for one bladder would hardly give room enough for that purpose.

#### *P R O C E S S.*

Things being thus prepared, and the phial containing the chalk and water being detached from the water, pour a little oil of vitriol upon the chalk and water ; and having carefully pressed all the common air out of the bladder, put the cork into the bottle presently after the effervescence is begun. Also press the bladder once more, after a little of the newly generated air has got into it, in order the more effectually to clear it of all the remains of the common air, and then introduce the end of the pipe into the mouth of the vessel of water, as in the drawing, and begin to agitate the chalk and water briskly ; this will presently produce a considerable quantity of *Fixible Air*, which will distend the bladder, and this being pressed, the air will force its way through the pipe, and ascend into the vessel of water, the water at the same time descending and coming into the basin.

When about one half of the water is forced out, let the operator lay his hand upon the uppermost part of the vessel, and shake as briskly as he can, not to throw the water out of the vessel, and in a few minutes the water will absorb the air, and taking its place, will nearly fill the vessel as at the first. Then shake the phial containing the chalk and water again, and force more air into the vessel, till, upon the whole,

with less danger to the glasses. At the second setting, half of the contents in the bottom vessel may be decanted, and fresh materials added, of water, vitriol, and marble dust, until sufficiently impregnated; but at every third setting, the bottom vessel should be made perfectly clean, and the whole apparatus should be washed clean every week. As soon as the water is sufficiently impregnated, it should be put into bottles, well corked, and sealed with wax, and the bottles should be placed on their sides, in the coldest corner of the cellar. If it is used from the apparatus, the ullage soon grows vapid. The *Fixible Air* being very volatile, ascends to the empty space, and flies off at the top, or with the water when it is drawn off: and this is a certain proof of its being genuine; *for when there is any vegetable or mineral acid mixed with it, an acidulous taste remains for many days in the ullage, as hap-*

whole, about an equal bulk of air has been thrown into it; also shake the water as before, till no more of the air can be imbibed. As soon as this is perceived to be the case, the water is ready for use; and if it be not used immediately, should be put into a bottle as soon as possible, well corked and cemented."

Extracted from Dr. Priestley's Experiments on Air.

*pens*

*pens to some of the foreign mineral waters imported into this country.*

*Of the various Combinations of the AQUA SALUBRIS with Wine, and other Liquors, and Method of using it as a Necessary of Life.*

That the *Aqua Salubris* may be productive of the good effects which have been so happily experienced, it must be combined with wine, cordials, or spirits. The following proportions will, I apprehend, be found the best: *when used with French, German, Italian, or home-made wines, from one third part to one half wine must be added to the Aqua Salubris; with those of Spain and Portugal, from one sixth to one third part at most; with cordials and spirits, from one eighth to one fourteenth part, according to their strength. Although these proportions will be generally found the best, yet they may sometimes be increased and diminished, according to circumstances.*

The *Aqua Salubris*, used in the manner I have recommended, unites more perfectly than wine or other fermented liquors, *three great requisites to human happiness, health, temperance,*

*perance, and chearfulness*: it is preferable to fermented liquors, as they are rarely equally fermented. Moreover, in these liquors, the *Fixible Air* is frequently in a state of effervescence, which is too apt to occasion disagreeable, and sometimes painful flatulencies, as is experienced in drinking Champaign, bottled beer and cyder. *The Aqua Salubris* is prepared without fermentation \*, and in it the *Fixible Air* is in a state of rest: its virtues are greatly increased by cold; and as a proof of its perfection, it bears concentration by frost. When taken cold into the stomach, combined as already directed, it pervades the whole system, quickens the circulation, and strengthens the habit, before it has time to grow flatulent,

\* The hissing which is observed when the marble powder is mixed with the vitriol and water, is a different phenomenon in nature from fermentation, as chymists well know. All acids whatever have a natural affinity with calcareous or chalky substances. The *Fixible Air* being an aerial acid, or vapour, is absorbed by the marble in the earth, or from circumambient air, and the effervescence which takes place when the marble powder is thrown into the vitriol and water, is owing to the impetuosity with which the stronger vitriolic acid dispossesses the aerial acid, which is lighter, and forces it to take its station, in proportion to its specific gravity.

which



which it certainly would do, if taken in an expanded state.

It is observable, that nations in a state of barbarity are delighted with ardent spirits, and drink to intoxication and madness: but as civilization advances, milder liquors are preferred, sobriety becomes necessary, and at length fashionable.

The reformation that has taken place of late years does honour to this country: there is certainly, upon the whole, much less hard drinking than formerly; and yet, I believe, I may be allowed to say, that in this particular there is still room for some amendment. Our taste is sufficiently refined, to have preferred the elegant light wines of France, and other parts of the Continent, to those of Spain and Portugal, which are strong and austere. From commercial motives, and the high price of the best wines consequent thereon, the preference has been given to the latter, which has served to keep alive the remains of a Gothic relish for strong liquors.

But it is fortunate for this country, that these strong wines may now be used to the greatest advantage, and made to supply the place of the most expensive wines. The *Aqua Salubris*

*Salubris* mixed in the manner I have mentioned, with good red port, Nice, Madeira, cherry, or Seges wine, will be found a most agreeable substitute for Burgundy, claret, and bock; equally elegant, they communicate a benevolent exhilarating warmth to the heart, are more invigorating and conducive to health, less heating and intoxicating, than any foreign wines whatever drank alone. With mountain, sweet Lisbon, and home-made orange and cowslip wines, as also with cordials and spirits, it furnishes a great variety of pleasing drinks very exhilarating and salutary. With sugar, honey, capillaire, syrups, and powder of ginger, and even by itself, it forms an agreeable healthy beverage, especially when drank in the morning or forenoon. The singular benefit I had received from the *Aqua Salubris*, combined in the foregoing manner, made it my duty to advise and recommend it to my friends, patients, and acquaintance of every description; and during the last seven years, the use of it has been attended with the same invariable success, except in a very few instances, which shall be mentioned hereafter.

It is very remarkable, that the most interesting discoveries have been made, and their utility

utility gradually unfolded, according as the circumstances of mankind, in different ages of the world, seemed to require, and as they became fit to receive and apply them. Of the truth of this observation some memorable instances might be given. When the time was approaching, that the terraqueous globe was to be circumnavigated, new regions explored, and the great family of mankind were to be introduced to each other, it was *then, the mariners compass was invented; the principles of astronomy were adapted to the purposes of navigation*, and instruments for the surveying the ocean were contrived, by which means an intercourse was opened *with the new world, equally astonishing to the enterprising Europeans, as to the wondering Antipodes whom they visited*. When the period drew near, that the arts and sciences were to be revived, and the human mind emancipated from the shackles of ignorance and superstition, *it was then the Art of printing was invented*, by means of which the world is now illuminated to such a degree, *as that Gothic ignorance can never again prevail*. It is now about eighty years since *the doctrine of Hales, taken from a hint of the immortal Newton*, was published

to the world, *in the dawn of experimental philosophy*. Before that time, I believe mankind was not sufficiently mature to receive and apply it. From that time to the present, the truth and merits of his doctrine have been gradually disclosed; and, I am persuaded, the time is drawing near, when, after a more perfect knowledge of the fermentive and putrefactive process, it will become the basis of a more rational, perfect, and intelligible theory than any the world has yet been favoured with, and lay the foundation for simplifying the practice of physic at a time when it appears to all considerate, sensible, humane men, so greatly requisite.

Reasoning, *à priori*, or from the first appearance of things, it might be concluded, as being perfectly consistent with the order of nature, the simplicity of its operations, and the benignity of its author, that the preserving, animating element, *Fixible Air* should, under various modifications and combinations with medicine, judiciously applied, constitute the most general remedy. It might also be concluded, if there were a general remedy, that it would be easily attainable, and of such a nature, as to be under some combination or other,



other, generally agreeable to the taste of the creatures whom it was calculated to preserve in health, and to restore when sick. The truth of the above conclusion is justified by a number of facts, with which every intelligent person, without being either a philosopher or a physician, may easily be made acquainted, to his perfect conviction.

1st. For upwards of thirty years, since the excellent essays of *Dr. M<sup>r</sup> Bride* were first published, the utility of *Fixible Air*, in the cure of diseases, has been manifested by all rational practisers, at home and abroad, especially in all kinds of fevers whatever.

2d. The efficacy of mineral waters in the cure of chronic diseases, has been for many years universally acknowledged, and, at the same time, the virtue of these waters is allowed by all who have studied the subject to consist in their being strongly impregnated with *Fixible Air*. *Dr. Elliot*, in his valuable publication, treating of the waters of *Spa*, enumerates almost all the chronic diseases incident to the human body, and among the rest barrenness, which are cured by these waters.

3d. The great utility of *the Aqua Salubris*, as a necessary of life, in preserving health, and preventing the return of chronic complaints, or greatly mitigating their violence, so as to render them very tolerable.

4th. The singular success of *the alkaline impregnated solution*, already mentioned, in cases of the stone, as appears from a valuable publication by Dr. Falconer of Bath, editor of an excellent commentary on *Fixible Air*, a work of the late much lamented Dr. Dobson. From this medicine the same success has been experienced in *rheumatism, scurvy, gravel, and other chronic complaints*, and sometimes the *gout*, by many under my direction for a number of years past.

5th. It is now certain, that the uniform cause of the health and longevity of the inhabitants of the more northern climates, arises from the condensation of *the Fixible Air*, by which means the air they breathe in, is strongly impregnated with it, and thereby the strength of the fibres and vital powers \* are greatly increased.

\* His late Majesty of Prussia had some reason to subscribe to the truth of this remark, after having, as he thought, beat the Russians for three days successively, he found a re-

creased. Hence the sharpness of frost, and the agreeable glow it occasions when not too severe. Hence the difficulty of breathing, to such as are troubled with the spasmodic asthma; and hence the practice of preserving animal substances perfectly sweet without salt, in Norway and America. There is, indeed, a degree of frost which is dangerous to animal life; but even on that occasion, *Fixible Air is still the remedy*; for snow, in which Fixible Air is strongly condensed, is externally applied, and used internally to prevent the fatal effects of frost on the living subject, *and with invariable success when seasonably administered.*

6th, The constant strong desire which those confined to beds of sickness, particularly in fevers, and many other diseases, *express for fruits and liquids abounding with Fixible Air*, for which they pant, and no wonder, as it is the deficiency of the preserving principle in the system, that is the cause of their complaint.

treat became absolutely necessary, and, in the opinion of his best friends, with the loss of a victory, which obliged that great man to confess, that he had indeed seen more brilliant troops, but never any so little disposed to go away.

7th. *Fixible Air* is easily procured in every civilized nation, and at a small expence, either as a necessary of life, or as a medicine.

8th. and lastly, It is so universally agreeable to every taste, that among many hundreds, I believe I might have said thousands in my lifetime, I never met with one of any age, sex, complexion, or description, who was not delighted with one or other of *the combinations already mentioned*; and truly it is impossible it should be otherwise, as the human frame could not subsist without it.

For these reasons, which I apprehend will appear satisfactory to every candid and intelligent reader, without being either a *philosopher* or a *physician*, and for reasons already given in the foregoing pages, it may be fairly concluded, *that elementary Fixible Air is not only the cause of firmness and health in the human body, but also under various modifications and combinations, intended by the author of nature, to be the most universal remedy. But this general remedy comes far short of what has been long vainly and absurdly hunted for by idle dreamers in physic, an universal panacea or medicine, that would cure every malady of itself alone.* For instance, *Fixible Air*, with  
all



all its virtues, cannot be administered in any way or form, that will remove an inveterate deep-seated chronic rheumatism, where the pericosteum, the sensible membrane which covers the bones, is greatly affected; in such a case, more efficacious medicines, *such as camphor, mercury, antimony, and opium,* must be administered with judgment, according to the circumstances of the patient, and persisted in for a reasonable time, until the obstructions are removed, and the symptoms are abated; *then, and not till then, will the elementary Fixible Air in the alkaline impregnated solution and the Aqua Salubris have the desired effect;* and the same may be said of other inveterate chronic diseases; and also of some of the acute kind, of which I have had no inconsiderable share of experience in myself and others,

#### STRICTURES on the PRESENT STATE of the PRACTICE of PHYSIC.

Among the many modern improvements, it must be confessed, that those in anatomy, surgery, and chymistry, are very considerable; and it affords me sincere pleasure to observe,

that the practisers in this country have had no small share of reputation in the improvement.

But although the practice of physic has been somewhat reformed, yet it certainly has not kept pace with the other arts and sciences in this respect, to the great mortification of every man of honour in the profession. The slow motion of physic, in its course towards reformation, is not owing to the want of learning or useful knowledge; for truly, there is much more of both to be found among the physicians of the present, than of any preceding age: they certainly know as much as their predecessors did, and a great deal more; but their superior knowledge, by one means or other, has not in general been exerted to the best advantage in the improvement of the healing art. Many reasons have contributed to retard the reformation of physic, and, I believe, the following are not the least:

1<sup>st</sup>. The practice has undoubtedly been much embarrassed with a variety of ingenious, fanciful, and contradictory theories, and frequently participating of them all, is but too often found to be *frivolous, whimsical, experimental and bold*; and although it were admitted that

that all these theories had merit, yet it would require a greater share of judgment, and discernment, than falls to the lot of every practitioner, to distinguish what is proper to be adopted, from that which ought to be rejected.

2d. It is to be regretted, that the apothecaries have, from long usage, been obliged to submit to the degrading mortification of being paid for their medicines, like labourers for their brick and mortar, instead of being remunerated for the exercise of *their skill and judgment in the line of their profession*, with an *annual allowance, or a reasonable fee*. This humiliating treatment of a respectable body of men has gradually introduced a very dangerous species of commerce, highly prejudicial to the successful practice of physic: it creates a suspicion, which, it is to be feared, is not always without foundation, that the physician, who is generally named by the apothecary, may be tempted to consider the interest of his employer in his prescriptions, by directing some additional draughts, which are not quite necessary, especially as the apothecary has no other way of being paid, than by the quantity of his medicines; but this species of seeming pious fraud, however

ever cautiously conducted, is frequently attended with the most dangerous consequences, especially to delicate patients, who, by a repetition of nauseous draughts, grow weary of their remedies, and sicken at the sight of numberless phials. This treatment disposes them to relinquish the means of cure, and submit to their fate, rather than pass through the apothecary's ordeal, or continue a fruitless course of medicine, which otherwise conducted, might have afforded them relief; while patients, with former habits, take every dose that is presented to them with no better success. I have seen such unhappy effects from this practice, that where I have had sufficient influence, I have always recommended it to the patient, or his friend, to give the apothecary an occasional fee, especially where there was appearance of danger; inasmuch as the medicines I prescribed were not adequate to the apothecary's trouble.

Nothing is better known to the best informed part of the faculty, than that a few well-chosen, well-directed medicines only are necessary to the cure of diseases in general. There cannot be a stronger proof of the truth of this assertion, than the uniform conduct of the faculty themselves when they are sick; I  
 appeal



appeal to their feelings, their candour, and their humanity, whether they would swallow the same quantity of unpleasant doses were they themselves sick, which are with so much facility prescribed to their patients: they indeed take but very little, and some of them none at all. He is, however, equally mistaken who despises medicine, as he who takes too much. The man is indeed unfortunate, and profitted but little by his observations in the world, let his profession be what it may, who has not distinguished between the rational use of medicine, and the abuse of it. The lot of human nature exposes us to a great variety of diseases through the different stages of life, from the weakness of infancy, the changes that take place in our approach to puberty, from the changes of weather, from our studies and our employments, our exercises and pleasures in our riper years; even the table is too often a snare: but wise and indulgent Nature has furnished remedies for these evils. ~~The~~ man, who has experienced an ardent fever, an excruciating rheumatism, or an agonizing choleric, under the care of an able and humane practitioner, ~~he~~ will not hesitate to celebrate the praises of a well-directed medicine.

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The due application of medicine, however, is only the exercise of scientific common sense; and when it ceases to be such, it becomes commercial trick and artifice, or the effusion of superabundant dulness and ignorance. For my part, when I am indisposed, I readily see the necessity of a seasonable remedy; but then I take it effectually, and in the least possible quantity that will produce the effect. As it is the duty of every man to do as he would be done by in every situation, *there surely can be no case where such a duty is more obligatory, than when it respects the health and lives of our fellow-creatures.*

But the faculty are not altogether to be blamed, they are rather to be pitied; the error originates from the mode in which the patient chuses to satisfy his apothecary. *I appeal to the good sense of this enlightened country, whether it is not highly improper, inexpedient, and even unsafe, to make it the interest of the apothecary to administer more medicine than is absolutely necessary; would it not be more wise to make them an annual allowance, or give them a regular fee for their attendance and medicine? By this judicious treatment, the physician would be under no temptation to glance at the interest*

rest of the apothecary in his prescriptions. By this treatment the stock of the apothecary would consist of *skill and judgment*, instead of a *huge farrago of useless medicines*. His genius would be exerted in contriving the most direct means of extinguishing a disorder, if possible, in the first instance, instead of studying the art of dividing and subdividing the lengthy prescription of *some celebrated mysterious physician, who, in the language of medical commerce, is said to write well*.

3d. *The mystery* in which physic has hitherto been involved, is not a little detrimental to the practice; it leads to a suspicion of a sort of mysterious confederacy betwixt the physician and the apothecary, often painful to the mind of the suffering, suspecting patient, and almost inclines him to consider them rather as his undertakers than his friends. It is hardly conceivable, in this refined age, that physicians should still continue to write their prescriptions in a foreign language, which, if known to the apothecary, is not always clearly understood by his apprentice, who is to prepare, and not at all to the mother or nurse, who is to administer the medicine. The characters, likewise, which are to determine the quantity  
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of each ingredient, are written in mystical figures, perfectly unintelligible to people in general, except the faculty themselves. The use of this mysterious parade, at first, was to convey an idea of *profound learning*, and to *conceal the secrets of the art*: Such an artifice might be pardoned during the darkness, ignorance, and pedantry of the 15th century, but is truly absurd and ridiculous at this day. I should be glad to be informed, what imputation there could be brought against the learning or judgment of a physician, were he to write in the language of the country his recipe, with which he intended to cure his patient, and which, in order to have effect, ought to be perfectly understood by the apprentice who is to make up, and those who are to administer the medicine?

Or if ancient inveterate custom has made it necessary, in order to avoid the suspicion of ignorance, for the prescriber to write in Latin, *would it not be wise, as well as humane, to translate his recipe?*

By so doing, the physician who, with all his learning, and even the best intentions, is not infallible, would be certain he had committed no mistake, and this precaution would be the means



means of preventing mistakes in others. I have seen such unfortunate consequences from prescriptions not being understood, that, for the future, I shall think it my duty to hazard the censure of the most precise part of the faculty, and give a translation of my prescriptions. Notwithstanding health and life are held to be more dear and valuable than property, yet it is astonishing, with how much more attention, the latter is regarded and secured than the former. In the purchase of an estate, there is always a deed, and a counterpart for the buyer and seller; but no security is required or expected from the physician, even while he has the patient's life and money in his hand at the same time. There can be no good reason given, why the physician should not be obliged by law to give a translated counterpart of his prescription, for which he has received a valuable consideration; it would at least be some degree of security for the safety of the patient.

4th. Prejudice and fashion is also greatly detrimental to good practice. It is not uncommon to meet with a popular physician, otherwise a man of respectability in his profession, who has taken up an inveterate prejudice

dice (for instance) against blood letting, so far as hardly to prescribe that remedy on any account, except in some very obvious case, such as an apothecary's apprentice ought to be dismissed for mistaking. But it is still more common to find another physician, perhaps of equal eminence and popularity, directing the use of the lancet, almost in every case, even when an apothecary's apprentice would at least hesitate; now these two kinds of physicians are equally to be blamed, and are equally hurtful to society in their practice. It cannot be denied, that inflammatory diseases are less frequent now, than in the days of *Sydnam*, the modern *Hippocrates*. The great use of tea, coffee, sugar, and other mollifying luxuries, has gradually introduced a soft fibre, instead of the rigid fibre of the last century, and therefore diseases tend more to putridity than inflammation; nevertheless, bleeding ever was, and ever will be an useful and necessary remedy. But unhappily for society, should two such physicians take a lead among the faculty, then are the errors of both sanctified into fashion among their followers, who either are not capable of discovering their mistakes, or want resolution to correct them. I remember, when in the West Indies,

Indies, an influenza, which extending over many latitudes, occasioned a general catarrhal complaint, accompanied with a difficulty of breathing and a pain in the side; notwithstanding bleeding in that country is in general pernicious; yet, on that occasion, I did not hesitate to direct it, which was attended with the most happy success, while those who neglected it, lost many of their most valuable negroes. The truth is, the application of powerful remedies depends so much upon the occurrence of various circumstances, as entirely to preclude fashion from good practice.

For the above reasons, and others arising from the same unhappy source, the incertitude of cure is greatly encreased, and the practice in danger of falling into contempt.

When I consider the great erudition and experimental knowledge with which some of the faculty are distinguished, I am convinced, that *even an able apothecary*, who has availed himself of all the modern discoveries and improvements, is greatly superior to *Hippocrates*, and the whole tribe of ancient physicians put together, in the treatment of a disease; and, consequently, that the present practice, in the hands of a few, is greatly preferable to the

*practice of any preceding age; but had Hippocrates lived in this century, and known what an able apothecary may at this day know, we should, long ere now, have had a theory and practice of Physic, as simple and perfect, as he was simple and great.*

But when, on the other hand, I contemplate the encreasing *commercial state of physic*, which naturally discourages the lopping off any superfluities which would be prejudicial to the *trade*, and checks the progress to that *simplicity which constitutes the essence of good practice*, and stamps a just value on the faithful <sup>actor</sup> performer, and at the same time consider the mistakes arising from *contradictory theories*, and the injuries that proceed from *mystery, prejudice, and fashion in physic*, I am persuaded there never was an age in which the practice was worse, in the hands of many ———. Nothing can redeem the sinking credit of the most honourable and humane profession under heaven, but the abolition of the degrading, inexpedient, and hurtful mode of satisfying the apothecaries, the banishment of commerce, mystery, prejudice, and fashion from the sacred art, and the introduction of a more simplified theory and practice. Such a reformation is devoutly wished  
for



for by every considerate, intelligent man, and by none more cordially than *the most learned, conscientious, and disinterested part of the faculty*, many of whom have lamented to me *the present state of the practice of physic in terms of deep regret.*

The foregoing strictures, I take this opportunity to declare, do not proceed from any want of regard to the faculty, as they seem, from their unfortunate situation, in a manner compelled into the practice of which I complain; but they proceed from a sincere regard to the profession, among whom I have some valuable friends, *who, as men of honour, and in the line of their profession*, are equally the objects of my imitation and esteem. No man entertains a higher opinion than I do of the physician, or other practitioner, who with learning, and the knowledge of nature in one hand, and integrity and humanity in the other, devotes his days to the relieving the pains and sufferings of the afflicted, he may be truly stiled the *friend of man*. There are indeed those of another description in every country, both regular and irregular; *but here I shall forbear to exhibit a picture, which a regard to the feelings of my readers, as well as my own,*

*forbids me to draw.* Suffice it to say, that *physic is an honourable and useful science to the learned and disinterested; but a trade, a sad trade to the selfish and ignorant.* There was a time when our less polished forefathers measured the abilities of the physician and apothecary, by the length of the prescription, and the number and strength of the doses; and strange as it may seem, there are still not a few who make this injudicious estimate. There was a time when almost every drug was cried up, as possessing some wonderful virtue; at this day, however, from the most accurate experiments and observation, the drugs of real worth in medicine are reduced to an inconsiderable number; and, it is now found, that the boasted virtues of the rest never existed any where, but in the imagination of the antiquated prescribers; yet there are still some of this sort of medicine mongers, who continue to punish society with their absurd prescriptions.

But in an age “more fertile in great events, than any of the preceding, distinguished by important discoveries, and the completion of former <sup>in</sup> events, distinguished by the encouragement given to the arts and sciences, and the

the success with which they have been cultivated \*." In an age, when great numbers of both sexes, and of all professions, are familiarizing those studies, which were formerly supposed to be accessible only to such as had dedicated themselves to literary and philosophical pursuits; in such an age, can it be doubted, that physic, like the other arts and sciences, will, at last, *be freely investigated, improved, and simplified?* and as a preliminary step to improvement, can it be doubted, *that the wisdom, propriety, and safety, of treating the apothecaries with a liberality becoming their profession, will be discovered and adopted?* by which means a necessary body of men will be rendered most useful and respectable. In such an age as this, can it be doubted, *that the plain, rational, almost self-evident doctrine of the preserving principle, elementary air, as stated in the foregoing pages, will be critically examined, understood, and applied;* and that the *Aqua Salubris* will, ere long, be prepared in every house, and its singular benefits generally realized?

Although I am persuaded, that my recommendation of the *Aqua Salubris*, and my strictures on the present state of the prac-

\* Baron Bulfield,

tice of physic, will receive the approbation of some of the most respectable part of the faculty ; yet I am, at the same time, sensible that they will create me many enemies, of which I have begun to have some experience. My endeavours to bring the *Aqua Salubris* into use, have already been attended with no small injury to my practice ; but regardless of consequences, I shall think it my duty to proceed with unremitting diligence in the benevolent undertaking, which, from the best intentions, I have ventured to begin. *I shall, therefore, without dread, commit myself to the justice and magnanimity of the Sovereign, and to the wisdom of the Legislature, of the most honourable nation on earth, which, I hope, will not suffer me to be undone by my liberality to the public.*

I cannot express the pleasure and satisfaction of mind I feel, in giving this communication of the *Aqua Salubris* to the world, as being the most honourable and essential service I can ever expect, at my time of life, to have in my power to render to the human race in general, or my country in particular. So much am I assured of its great utility, that I do not scruple to hazard the opinion I would  
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with to be formed of my integrity as a man, and my reputation as a physician, on the conviction of the most discerning and philosophical man of this, or any other country, resulting from a fair and an impartial trial: nor am I ambitious of any greater credit in the line of my profession, than to be chiefly instrumental in bringing it into use, and making its virtues generally known.

*Thus I have performed a duty, which a regard for the interests of mankind, and a love to my country, would permit me no longer to delay.* What share of approbation I shall receive from the present age, I do not pretend to conjecture; but I rest assured, when remaining prejudices shall have yielded to further advances in science and experimental knowledge, that I shall hold a place in the grateful remembrance of generations to come, in consideration of being the physician who first communicated the extensive virtues of the *Aqua Salubris*, and recommended it to general use, as a necessary of life, as the most rational means of attaining length of days with happiness, and of preventing and alleviating the pains and sufferings incident to mankind; as the physician who, greatly to the prejudice of his personal interest,

published an advice, which will remain unalterably valid in every climate, and through all succeeding ages, so long as the human frame shall consist of the same materials, and while the laws of nature shall continue the same.

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I COME now to point out a number of diseases which commonly admit of a temporary relief from a judicious administration of medicine, but which, to the great mortification of the patient, too frequently recur. Happily, however, the return of these complaints may now be prevented by the use of the *Aqua Salubris*, as a necessary of life, in the manner I have directed; or their virulence may be greatly mitigated, so as to render them very tolerable.

Every intelligent person must be sensible, that it is much easier to prevent maladies than  
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to cure them. He must be sensible that constitution, health, and even character, in a great degree, depend on what he eats and drinks, and the manner in which he lives. He must also be convinced, that he, as well as others, from the vicissitudes of the weather, from his employment, from his convivial pleasures, and other causes, is daily liable to various complaints, particularly rheumatism, gout, gravel, stone, scurvy, debility, and other chronic disorders, in his own right, and sometimes by inheritance. Those who reasonably expect to enjoy the sweets of health, will readily perceive the necessity of a wise regulation of the passions, of attention to diet, and of temperance in eating and drinking: they will see the necessity of exercise, exposition to the weather, regularity of hours, and early rising. But notwithstanding the greatest care that can be taken, we are still exposed to the disorders already mentioned. Those who are so faithful to themselves, as to lay aside their prejudices, will find the *Aqua Salubris*, combined as directed, the most agreeable, and at the same time the most effectual preservative against these complaints, or it will, at least, render life very comfortable under them.

But

But too much is not to be expected from it, when these complaints come on with great violence, or have been of long standing, more powerful medicines will, in the first instance, become necessary: the elementary principle, *Fixible Air*, valuable as it is on such occasions, must be considered as a preserving, restoring, convalescent remedy, rather than an active and powerful medicine. What numbers of every description who, like myself, *have been* afraid to go to bed, in dread of tedious and restless nights of agonizing pain, and who shall have the prudence to avail themselves of the wholesome, disinterested advice now given, will pass the remainder of their days in ease and tranquillity.

It has been observed to me, that as simple water seems to have been the only drink for man, in a state of nature, it ought, on that account, to be the only drink in a state of civilized society. Those who hold such an opinion, seem to forget, that a pure state of nature, if ever there were any such, must have existed at a time of which we have no records; for, by every account of the most barbarous nations yet discovered, they have afforded no inconsiderable testimonies of their being directed



rected by art. I apprehend *art* to be the best *improvement of nature*; or, in other words, it is the exercise of the human intellect, in discovering the *best application of the various productions of nature to the use of man*. In an absolute state of nature, the human species must have employed their whole attention about their mere subsistence, feeding on acorns and nuts, and such like wild productions, and drinking the waters of the brook; they must have covered themselves with *fig-leaves* or skins, and sheltered themselves from the inclemency of the weather in caves and holes of the rock: they must have passed a dreary solitary existence, in contemplation of Providence, to be the progenitors of subsequent generations, which, in process of time, were to be subdued and civilized by *art*; but to show that water was not intended as the sole drink of mankind, at least in a state of society, it needs only to be observed, that wine and strong liquors were used in the very earliest of ages, of which we have the most distant accounts.

For my own part, I am disposed to believe, that the Author of our being, who giveth liberally, and upbraideth not, did not intend to feed the human race like felons, on bread and  
water;

water ; but having furnished us with animals and vegetables for our use, and to be raised and cultivated by our industry, hath also instructed us by art, to prepare wine, cyder, beer, and other fermented liquors, not only to enable us to sustain the laborious toils of husbandry, manufactures, and commerce, but also to render the life of man social, comfortable, and agreeable. So far is water, valuable as it is, from being intended as the only drink, that I may safely affirm, that wine is equally natural with water ; for the fermentive process is nature's own work as much as vegetation, and that the juices of the grape, apples, and other fruits, may not be lost for our use, the fermentive process takes place of its own accord, without our intervention. We can indeed regulate, or accelerate, and restrain fermentation, but we can no more produce it, than we could cause a tree to vegetate.

### R H E U M A T I S M.

I have already observed that the rheumatism, and other chronic diseases, and probably many of the acute kind, are occasioned by a deficiency of Fixible Air in the system.

This

This elementary preserving principle, being extremely volatile, readily makes its escape through the pores, even when they are so much obstructed as to prevent the transpiration of grosser matter, which ought also to transpire, and leaves the saline, oily, inflammatory, earthy, and aqueous particles to act upon each other, in proportion to their respective attracting, and repelling powers, which thereby form new and various combinations productive of these complaints \*; or, in other words, whatever obstructs the perspiration, whether changes of weather, exposition to heats and colds, wet feet, damp situations, thin clothing, or unwholesome indigestible food, when the fermentive process in digestion goes on badly, and furnishes but little Fixible Air, all these may be considered as the remote causes, and the various new morbid combinations formed in the ab-

\* " We have no where, says an excellent philosopher, more striking examples of the conversion of matter into new forms, than in the bodies of animals: changes effected by a natural process, which art has in vain attempted to imitate or account for."

NEWMAN'S CHYMISTRY.

fence

fence of the Fixible Air, may be called the proximate causes of these maladies.

There are two kinds of rheumatism, the acute and the chronic. The acute is usually attended with fever and inflammation, and sometimes with a swelling of the parts affected, and should be treated like any other inflammatory fever. It generally attacks youth and the adult, who are what is called plethoric, or full of blood; but as this kind does not come under the class of the disorders of which I am now to treat, I shall pass to the chronic rheumatism, so called from its continuance.

This complaint commonly afflicts persons ceasing to be young, and the aged. The chronic rheumatism is rarely accompanied with fever, inflammation, or swelling. It is usually stationary, and seizes upon a particular part of the body, frequently the large articulations or joints, the shoulders, hip-bone, back, loins, or knees. Sometimes it is almost universal, at other times it is erratic, and wanders from place to place, and on that occasion it greatly resembles the gout.

The following effectual remedies I have used myself to remove this complaint in the  
first



first instance, with constant success, and for a number of years have prescribed with equal advantage to many others. In the first, I put myself upon a cooling diluting regimen for two or three days before I take any medicine, such as weak mutton broth, milk porridge, or water gruel with a little wine; I then begin my medical course with cleaning first the passages with a gentle antimonial emetic. The second night after taking the emetic, I take the following medicine :

R Camphor, five grains, mercurius dulcis, or sweet mercury, three grains, conserve of roses, the bigness of half a nutmeg, formed into a bolus ; after which I take the *following draught*, and occasionally repeat it every third or fourth night after :

R Antimonial wine, twenty-five drops ; Thebaic tincture, or laudanum, the same quantity ; pure water, an ounce and a half.

The night following I take a bolus, with only two grains of sweet mercury, but the  
other

other ingredients as before, and so continue taking it every night until my pains abate, or my mouth is a little affected. When that happens to be the case, I desist, and take the following opening draught, half at bed-time, the other half in the morning early :

**R** Powder of rhubarb, twenty grains ;  
 sal. pollychrest. two drachms ; tincture  
 of rhubarb, three drachms ; mint water,  
 an ounce ; pure water, an ounce and a  
 half.

In a night or two after, I repeat the bolus, and sometimes the antimonial draught with or without the laudanum, according as circumstances require, and thus proceed in the same manner as before, until my pains are considerably abated ; I then commence the use of the alkaline solution, saturated with *Fixible Air*, which I distinguish by the name of *Aqua Salubris Alkalina*, and is the same as the *Aqua Mephitica Alkalina*, so highly and justly recommended by Dr. Falconer, which I have already had occasion to mention.

This valuable solution is prepared most conveniently in the following manner :—Put two  
 ounces

ounces and a quarter of the salt of tartar \* or wormwood into an open earthen vessel, commonly called Queen's-ware, and add to it five wine quarts, or a little more, of distilled, or other pure and soft water, and stir it about for the first hour frequently, with a piece of clean wood, and let it stand to dissolve for the space of twenty-four or thirty hours, then pour off, clear and free from any residuum or deposition of any indissolved matter that may remain, as much as will fill the middle glass of Dr. Nooth's apparatus; the alkaline liquor is then to be impregnated with Fixible Air for the space of forty-eight hours, during that time; when the *Fixible Air* ceases to rise in the lower glass of the apparatus, fresh materials must be put into that glass to renew the effervescence, which must be repeated four or five times, and then the *Aqua Salubris Alkalina*, or the *alkaline solution*, will be sufficiently impregnated:

F

it

\* For a very inveterate rheumatism of a long standing, and when the circumstances of the patient will admit, I have sometimes increased the quantity of the alkaline salts, and directed two ounces and a half, and sometimes three quarters, with the same quantity of water already mentioned; but when the use of the solution becomes necessary for a length of time, I apprehend the first prescription

is

it is then to be put into half pint bottles, which are most convenient, and to be well corked and cemented with wax, and laid on their sides in the cellar, or other cooler part of the house. Of this solution I drank about eight ounces, or half of a pint, every sixth hour, in the morning, at noon, six in the evening, and bed-time, with a little Holland's geneva or brandy, and well sweetened with honey, and sometimes with milk added, for the first two or three days; then I proceed for a few days more with a half pint every eighth hour, and at last with one half pint evening and morning, until my pains are abated; in the mean time I use the Aqua Salubris in the manner prescribed as my common daily drink. I had made trial of Mr. Bewley's method of taking the alkaline solution, but by repetition, it became disagreeable to my stomach, which led me to the foregoing method, and which I have practised ever since. *Mr. Bewley* certainly had the merit of discovering, that al-

is sufficiently strong; also in a violent sciatica, or where the situation would admit, I have directed cupping, and the same evening a blister to be applied, and, as soon as the blister was skinned over, the frequent application of Dr. Steers' Opodeldoc, with manifest success.

kaline



kaline salts are capable of being *neutralized* by *Fixible Air*, and it appears that Mr. Colburn, of Bath, has the credit of ascertaining the *solvent power of the alkaline solution* in calcareous cases, or stone and gravel. *I believe I am the first*, at least as far as I know, who has applied the alkaline solution to *the cure of the rheumatism*, for a number of years, with equal and invariable success; the effectual remedies already mentioned, being first taken. The return of my rheumatism is effectually prevented by the use of the *Aqua Salubris*, until I either discontinue it, or am attacked with a severe cold, on which occasions I feel a slight degree of my complaint; but these slight returns yield to a few doses of the solution, and the use of the *Aqua Salubris* as my common drink. In this disease bleeding is generally very prejudicial, as also severe purgatives, which only serve to reduce the strength of the patient, and to continue and rivet the complaint. Some years ago I knew a Lady, a little upwards of fifty years of age, who had been confined to her bed by the rheumatism, and also complained of an obtuse dull pain in her side, which, however, did not affect her breathing. She had unfortunately lost about

ten ounces of blood, by the advice of a physician, and was taken so ill soon after, that her friends despaired of her life, and another physician was immediately called in. When he arrived, he found the loss of blood had occasioned a severe intermittent fever, and the pain in her side still remained as bad as ever. He directed a blister to be immediately applied to the side affected, by which her pain was soon relieved; but it required some time, with bark, generous wine, and nutritious diet, to subdue an obstinate tertian. This mistake was a strong example of medical prejudice and fashion, or what the *excellent Dr. Zimmerman* very justly calls *routine, and false experience in physic*. No two characters have a greater resemblance to each other, than the *able General* and the *experienced Physician*; they both act with a constant conformity to the occurrence of various circumstances which may arise; therefore I may safely affirm, there never was, in any age, *an able man, and faithful to his trust, either a fashionable General, or a fashionable Physician*.

GOUT.

## G O U T.

Although I confess I do not know an instance where the use of the *Aqua Salubris* has prevented the return of this complaint, yet I can, with as great certainty affirm, that it has contributed greatly to mitigate the *paroxysms*, and to render them less frequent, when used as a common drink. This disorder, like the former, is owing to a deficiency of the *Fixible Air* in the system, and the morbid matter which is accumulated, may be in a great degree resolved by the alkaline solution, and the accumulation greatly prevented. During the fit, little or no assistance can be effectually given; all that can be with safety done is, to administer gentle, warm, laxative medicines, to carry off the offending matter, and frictions to the parts affected, and to endeavour to keep the disease at the extremities, the greatest distance from the more vital parts. Should it ascend to the stomach or head, in such a case, wine, cordials, or opiates, must be employed, in sufficient force, to remove it. As soon as the fit, which consists of a number of paroxysms, is over, the patient, if he is prudent,

dent, and has learned to profit by his past sad experience, must immediately, with resolution, apply himself to the best means of lessening the violence of the succeeding fit. The best means of affecting so *desirable a purpose*, is to avail himself of the *alkaline solution*, guarded with good Madeira, cherry, or good old spirits, and sweetened with honey, if it agrees with the stomach, at least three times a day, or twenty-four hours, and for some considerable time after to take it evening and morning in the same manner, and at the same time making the *Aqua Salubris* his usual drink, and observing a temperate, easily digested and nutritious regimen. Were such a conduct steadily attended to, immediately after the first attack, or first approaches, there seems little room to doubt, that the return of the gout might as easily be prevented as the return of the rheumatism.

### G R A V E L.

When sand or small stones are lodged in the kidneys, or discharged by urine, the patient is said to have the *Gravel*; but when a stone or stones fall into the bladder, and accumulates  
by



by means of mucous and fabulous matter, to a size that will not admit of being passed by urine, it is then called the *Stone*.

In a severe fit of the gravel, if the patient happens to be young and plethoric, then letting of blood may be necessary, with fomentations, or warm bath up to the middle: after which, the alkaline solution may be taken as directed for the rheumatism, at least three times in twenty-four hours, for the space of two or three days, or more, until the symptoms abate, and the gravel disappears, and at the same time the *Aqua Salubris*, as already prescribed, should be the usual and daily drink, with now and then a laxative medicine. As the aged are not, in general, liable to inflammation in this disease, bleeding is not only *rarely necessary*, but usually *hurtful* to them; therefore, when the fit is severe, the same remedies recommended for the rheumatism, in the first instance, may be used with advantage. If the patient is very young, the solution must be reduced to two-thirds, or one half the quantity given to adults, in proportion to his age, and with a due regard to other circumstances.

## S T O N E.

When the stone falls into the bladder, and accumulates to a size, which prevents its passing by urine, the alkaline solution \* must be used, as already prescribed in the gravel, or a warm injection, consisting of two third parts of the solution, and one-third part of it may be administered with common water. This operation is now rendered easy, by means of the flexible catheter, a modern valuable invention; the solution, by injection, possesses all its solvent powers entire, which are certainly diminished, when taken by the mouth in its transition to the bladder. There seems no danger from irritability in the use of the injection, which is not near so irritable as the urine of a healthy person; and there can be no danger from the distention, if care is taken not to inject the solution too suddenly. Whichever is preferred, *the use of the solution* should be continued until the pains are

\* The solution may be increased in its solvent power, should the nature of the case and circumstances of the patient require it. See the preceding note.

removed,

removed, and the stone diminished, or perhaps dissolved; *then the Aqua Salubris*, as prescribed, sweetened with honey or capillaire, will be the best usual drink, and, in all probability, prevent the future accumulation of the stone \*. It is fortunate for those afflicted with this disorder, when they like honey, for they may, with great advantage, indulge the use of it. The food in general should be bland, and moderately nutritious; and when the *Aqua Salubris* may prove too irritating, which it sometimes does in cases of the stone,

\* "That calcareous earths are made soluble in water, by being united with more than their proportion of Fixible Air, has been pointed out by a series of well-conducted and accurate experiments of an eminent modern philosopher, the Hon. Mr. Cavendish. This discovery suggested the idea of the solubility of the human calculus while yet in the bladder, by the regular and continued use of Fixible Air. Dr. Saunders and Dr. Percival first inculcated this opinion; and the first of these Gentlemen pointed out, that the diminution of calculi, or small stones, being put into fermenting mixtures, as observed by Dr. Hales, was effected by the Fixible Air liberated in these mixtures. The diminution likewise of some calculi, by being immersed, and macerated in water impregnated with Fixible Air, has been proved by the experiments of Doctors Saunders, Percival, and Falconer."

DOBSON'S COMMENTARIES.

muci-

mucilaginous liquors, such as lintseed tea, barley-water, and such like, may be impregnated with Fixible Air, and used with much benefit to the patient,

### BLOODY URINE.

Persons liable to the foregoing disorders, are also subject to pass bloody urine. It is occasioned by the acrimonious matter which constitutes the rheumatism and gout, or small gravel and stones eroding the coats of the ureters: the patient should drink half a pint of the *Aqua Salubris*, sweetened well with honey, to which should be added half an ounce of the syrup of poppies, and six drops of the spirit of turpentine, three times in the twenty-four hours, for two or three days; and while he continues the *Aqua Salubris* as his usual drink, in the manner already recommended, he may rest assured it will not return.

### S C U R V Y.

There is no disease, except the plague or leprosy, with which the human body is afflicted, in which there is a greater deficiency of the  
Fixible



Fixible Air than in the Scurvy, especially that species of it contracted on long voyages, called *the Sea Scurvy*. Constantly living on salted meats, musty bread, and bad water, for a length of time, frequently produces the highest putrid and malignant symptoms. The fibres lose their elasticity and tenacity, to such a degree, that it is attended sometimes with danger that the patient can be moved: but even in this deplorable situation, the *Fixible Air* affords the patient almost instantaneous relief; the best remedy is the alkaline solution, taken in the same manner as prescribed for the rheumatism. When the *alkaline solution* cannot be prepared for want of an apparatus, it may be used after the manner recommended by Dr. Hulm; “ take of pure salt of tartar, one ounce troy weight, dissolve it in sixteen ounces of common water, and call it the *alkaline mixture*; also take of weak spirit of vitriol, two ounces (in measure) of common water fourteen ounces, to be called the *acid mixture*. Let the patient take half an ounce (in measure) of the alkaline mixture, in three ounces of common water, four times a day, and immediately afterwards let him drink half an ounce of the *acid mixture*, in the same quantity

tity

tity of water, and continue these medicines till the scorbutic symptoms disappear, and the patient's health be restored. If occasion should require, the dose may be increased to double the quantity." The *Aqua Salubris* should, at the same time, constitute the daily drink of the patient, a continuance in which will effectually secure him from a return of the disease.

I have had great satisfaction in finding the efficacy of the *Aqua Salubris* in scorbutic complaints, confirmed by a variety of trials during some long sea voyages. About five years ago, Capt. Portlock, of the King George, and Capt. Dixon, of the Queen Charlotte, sailed on a voyage to the South Seas, and the Northward coast of America; I directed a quantity of the *Aqua Salubris* to be sent on board each ship, in order to put it to the most severe test. Upon their arrival from their voyage round the world, *they both assured me, it had in every scorbutic case the best effects.* Capt. Dixon was himself brought to the brink of death with a severe scurvy, accompanied with a malignant fever, and attributes the favourable escape he made to the great antiseptic power of the *Aqua Salubris*; and immediately, upon his  
return

return to London, had recourse to the use of it again. I also sent some to a friend on board of an East India ship, on a voyage to China, where it had the same immediate happy effects in some very dangerous scorbutic cases. It is unfortunate for the seamen, who are necessarily exposed to the ravages of this fatal disorder, that no good method has yet been fallen upon to impregnate a large quantity of water at once, as the glass apparatus, which certainly prepares it most perfectly, is too frangible for use at sea. The difficulty lies in giving the Fixible Air a proper direction from one vessel to another, and making the pipe of communication between them air tight, otherwise the Fixible Air makes its escape, and the water is not sufficiently impregnated. Here Dr. Priestley's invention, though very meritorious, as leading to the improvement of the glass apparatus, yet requires too much address to be very useful. I have heard of several other methods, but none of them, I believe, have given satisfaction. The following method has been suggested to me by a friend of mine, but I do not know that it has been tried: Let two casks be made, one to contain thirty, and the other

other about eight gallons, the smaller vessel to be contracted at the head, as much as conveniently can be done, so as to preserve strength. Let apertures, capable of being stoppt air tight, be made in the head of each cask, for filling water into the larger, and putting the materials for liberating the Fixible Air in the smaller cask; let the vessels communicate with a leathern pipe, one end of which to be inserted, air tight, into the head of the smaller vessel, and the other end into the side of the larger cask, about four inches from the bottom. The large cask to be filled about three parts full of the best pure soft water that can be got, or the water commonly used, then put four gallons of water into the smaller cask, and add two pounds (averdupoise) of the spirit of vitriol, and the same quantity of marble dust, and afterwards secure the apertures in each cask with stoppers or plugs, air tight. In half an hour, or an hour at most afterwards, let the large cask be well agitated, and repeatedly, and the smaller one must be occasionally shaken, but gently, lest the materials contained within should be driven into the pipe; and every three or four hours, let some of the fresh materials be put  
into



into the smaller cask, about one quarter part of what was used at first, until it is sufficiently acidulated, which may be known by drawing a little off from a wooden cock in the large cask. A brass cock must not be used, as the Fixible Air would corrode the brass, and injure the water. As soon as the water is sufficiently impregnated, it should be secured in large stone bottles, well corked and cemented with pitch or turpentine, prepared with a little tallow for the purpose; and when a bottle is opened, it should be immediately used, as the impregnated water soon loses its virtue when exposed to the air. It is to be hoped, that some more commodious and perfect method of preparing the *Aqua Salubris*, especially for the use of ships on long voyages. It is but reasonable some trouble should be taken to preserve the health and lives of our seamen, on whose *valour* and *laborious services* this great nation depends for her *security*, and for her *wealth*.

*Hypochondriac and Hysterical Affections.*

These disorders in men and women are very similar, as far as the difference of the sex will admit

admit. Persons of relaxed habits and defective digestion, which ever go hand in hand, are in every climate subject to them. They are generally, in this country, called *nervous* complaints. The word *nervous* is here totally misapplied, it originally and emphatically implies strength; but by an unaccountable misapplication of terms, it is now used to denote weakness, or, in other words, that the system of the nerves is affected. Admitting the error, in order to be understood, I must in the first place observe, that these complaints require but little medicine, and only such as tend to strengthen the fibres and the digestive powers. My intelligent readers suffering under these complaints, and who reasonably expect to enjoy health and strength in the future part of their lives, must put on resolution, and lay aside their former prejudices: they must begin with a substantial breakfast; almost all the nervous persons of both sexes should eat a Sandwich in the morning, especially if they cannot do without tea. They should likewise eat a substantial dinner, avoiding things that are windy, and take little or no supper, such as a crust of bread and a glass of wine, or such like; and the *Aqua Salubris*, already prescribed, should be

be their common drink. On the other hand, if they take a thin slice of bread and butter, and a few dishes of disvigoring tea, by the hour of dinner they are replete with wind, upon which they throw a great combination of discordant matters, and the stomach, astonished at the unreasonable task, is neither able nor willing to perform it; but there are others who are subject to the same complaints from different causes. Few indeed in this, or any other country, comparatively speaking, have it in their power to be guilty of luxury; and chronic disorders may arise from low living as well as high. The excessive use of tea among the middling and lower classes, especially since the reduction of the price, confinement, sedentary and hurtful employments, have rendered these disorders so general, that they are no longer confined to the indolent and rich. As all these descriptions of persons, both high and low, are much afflicted with flatulences, the constant effect of indigestion, I shall just observe, that the *Aqua Salubris*, as prescribed, is found, in common cases, to be the best expeller of wind \*, (a great part of

G                      which

\* Dr. Dobson prescribed the effervescent draught three times a day, to a patient troubled with flatulence for a length

which is atmospherical air), and is much more safe than ardent spirits alone, which are too often employed upon those occasions : and for this obvious reason, the *Aqua Salubris* infused with a little spirits, being taken cold into the stomach, and being at the same time very volatile, and specifically heavier than the expanded air it meets with, necessarily expels it, and suddenly pervading the system, by its stimulus it accelerates the circulation, and gives vivacity to the sinking spirits of the patient, before oppressed with expanded air ; but there are cases when the inflations are very great, in which the Fixible Air in the *Aqua Salubris* would be prejudicial. Other remedies, such as opium, ether, common spirits, infusions of ginger, or of juniper berries, will be more proper, taken with judgment. Such as are troubled with violent nervous headaches, should not meddle with the *Aqua Salubris*, until they are gone off ; afterwards it will be of use.

length of time, with manifest advantage ; and also for the loss of appetite, with the same success.

See his Commentaries, page 105—108.

In the *Aqua Salubris* the Fixible Air is in a state of rest, which renders it still more safe and useful to flatulent patients.

Thus



Thus I have stated, from my own experience, the salutary effects of the *Aqua Salubris*, used as a necessary of life, in preventing the return, or greatly mitigating the violence of a number of chronic diseases, which, if neglected, sadly imbitter our passage through life, and lay the foundation of a miserable and decrepit old age. *Fixible Air*, considered as a medicine only, has been applied with remarkable success in a great variety of cases. Dr. Dobson, as appears by his excellent Commentaries, found its salutary effects in putrid fevers, ulcerated sore throats, measles, small pox, gangreens, cancerous ulcers, flatulences, and some diseases of the stomach. Dr. Hulm and Dr. Withering observed its efficacy in pulmonary consumptions; and I have seen whey impregnated with *Fixible Air*, and well sweetened with honey, produce good effects in that complaint, but it is apt to irritate the cough, unless a little syrup of poppies is added to take off the irritation.

*Of the Use of the AQUA SALUBRIS in hot Countries.*

As the health of northern countries is owing to the condensation of *Fixible Air*, so the

sickness and mortality in southern climates are owing to the expansion of the same elementary principle, and its being absorbed by the moisture of the atmosphere. Relaxation is the consequence of great heat and moisture, and excessive bilious secretions are the consequence of relaxation; for this reason, almost all the tropical diseases may be said to proceed from a bilious putrescence. The most destructive diseases of these countries are the remittent putrid fever, the dysentery and liver complaint: in cold latitudes, the lungs are sooner affected than the liver; but in hot climates, the excessive secretion of bile exposes the liver to suffer from obstruction, inflammation, and suppuration. The *Aqua Salubris*, from its singular power of resisting putrefaction, and restraining the secretion of the bile and its febrifugal and convalescent qualities, will be an inestimable acquisition to these unhealthy countries. It may be used to the greatest advantage as a common beverage, combined with Madeira or red port, which last is too strong and heating to be drank alone in these countries.

I have heard with equal astonishment and concern, of the great quantities of mercury  
that

that are prescribed in this disorder. A friend of mine, lately from the West Indies, assured me, he had known one drachm of calomel given in one week to a patient, which is at the rate of more than eight grains a day. Alas, to what an alarming pitch does fashion carry the practice of physic! Mr. Clark, who has favoured the world with a very sensible history of the diseases of India, says, " There can be no doubt, that the excess of mercury is greatly exaggerated. It is so fashionable a remedy, that it is prescribed in slight affections of the liver, which, in all probability, might have yielded to one bleeding or two, the repetition of gentle physic, or the application of a blister."

There can be no doubt, however, that before the matter is formed, a due use of mercury may be very expedient, as is found in this country on similar occasions.

For the benefit of the Colonies, where I have many much respected friends, I will propose a method of treatment, which I have known to succeed in obstinate and dangerous cases. If the complaint is original, and not the consequence of some former disease, let the

side be cupped in three different places at least, upon the first indication of the disorder. A few hours after let a blister be applied to the parts that have been cupped, from which there will issue a copious quantity of matter for perhaps forty-eight hours. The same evening, the following medicine must be administered : Argent. viv. or quicksilver, ~~water~~  
*resin of Guaiacum* grains ; camphor, three grains ; and Castile soap, four grains, with a sufficient quantity of syrup, and form two pills, drinking after it a cup of wine whey. Next morning, let the patient take a pint of the alkaline solution already mentioned, which may have the cold air taken off, by dipping the bottle in warm water, adding to it a little brandy, and sweeten it well with honey, of which also the patient may eat freely. Next night he must repeat the pills, with only two grains of mercury, and the alkaline draught the following morning, and so continue these medicines until his symptoms are abated, or until his mouth is affected ; in that case it will be proper to desist : give a gentle opening draught, and proceed as before, until the patient is relieved ; if necessary, an opiate must intervene, to prevent the mercury passing downwards ; but  
 should



should the disease be the consequence of a fever or flux, the following medicine may be taken, which has been successful in some dangerous cases of the liver ;

*R Solvent mineral* from Apothecary's-hall, *six grains ; spirit of sal. ammoniac, thirty drops,* being exceedingly well triturated in a glass mortar, to which add thirty drops of the sweet spirits of nitre, and thirty ounces of pure water, and make a mixture, of which the patient must take half an ounce, or one table spoonful evening and morning, taking between them three or four effervescent draughts, viz. salt of tartar, and one spoonful and a half of lemon or lime juice ; or it may be taken to rather better advantage, as recommended under *the Scurvy* : these remedies to be persisted in until the patient is relieved—no acid to be taken while under this course ; the diet should be very light and diluting, rice or water-gruel, with some generous wine in it : this treatment in a putrid case, is certainly preferable *to a salivation*. As soon as he has laid the mineral solvent aside \*, he must continue the

\* This medicine was suggested by the ingenious Dr. De Vallingine.

*Aqua Salubris* as prescribed, for his daily convalescent drink.

In the remitting putrid fever, it is absolutely necessary the first passages should be cleared with an emetic,

R dissolve an ounce of manna in a pint of warm water, and strain it, add two grains of tartar emetic, and give one quarter part of the whole every half hour till it operates. As soon as the patient is able, he must take the bark in as large doses as his stomach will bear. The bark is most powerful in powder; but if the stomach will not retain it, recourse must be had to the decoction; he must drink the *Aqua Salubris* as his constant drink, with red port or Madeira plentifully, which is more antiseptic than the wine alone; where that is wanting, sangris of Madeira should be his constant drink. The bark, where there are marks of putridity, should be given, without regard to the remissions or exacerbations of the fever. The time, on this occasion, is too precious to be lost in useless expectation.

In the Dysentery, an emetic must also be prescribed, after which the following remedy must be taken, from which I have seen almost

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invariably the best effects. R Castor oil, freshly expressed, half an ounce, mixed with the yolk of an egg or honey, or gum arabic, in two ounces of simple cinnamon water, and half an ounce of the syrup of poppies, to be taken at night going to bed, and to be repeated with or without the opiate, according to circumstances, until the patient is relieved. Should symptoms of putrescency encrease, recourse must be had to the bark with wine; glysters of the decoction of bark with wine also. During the different stages of the complaint, the *Aqua Salubris*, as prescribed, ought to be his common beverage, and should be persisted in, at least until he is perfectly recovered. I must add, on this occasion, that bleeding is fatal in general in the dysentery of the hot climates, and frequently hurtful in this country.

*Situations where the AQUA SALUBRIS is most necessary and useful.*

1st. Hospitals, where the putrid effluvia from the breath of their sickly inhabitants, is the source of a malignant fever peculiar to them.

2d. Jails

2d. Jails and prisons, where the evil is greatly encreased by the close confinement of wretched criminals, sometimes productive of a jail fever, nearly as malignant as the plague. Had that unexampled pattern of humanity, *the excellent Mr. Howard*, been acquainted with the virtues of the *Aqua Salubris*, while on his benevolent pilgrimage, he might, by his humane sollicitations, been instrumental of spreading a greater degree of chearfulness through the mansion of despair.

3d. Colleges and seminaries of learning will find great advantage from the artificial mineral water, not only in promoting health, and inducing temperance, but as most friendly to genius, and the exercise of the intellectual powers.

4th. Watering-places. It would be greatly for the health of invalids, as well as those who go for amusement, to add the benefit of the *Aqua Salubris* to that of the sea bathing.

5th. Manufactories. The people confined to sedentary employments, many of them hurtful, will receive great benefit from the use of the artificial mineral water, and moreover, it certainly will tend to make them more inventive.

To



To conclude, having with unremitting assiduity, for a number of years, been enabled to ascertain the virtues of the *Aqua Salubris*, and having the most satisfactory evidences of its extensive usefulness in every climate; and moreover, having determined to make it one of the principal objects of the residue of my days, to inculcate the use of this valuable acquisition, I have thought it a duty I owe to society, to cause it to be prepared under my inspection, and to be placed in the hands of respectable persons, to be disposed of, for the accommodation of such as may find it either inconvenient or impracticable to prepare it for themselves. As it had become absolutely necessary, that some one of the profession should develop the causes of the present unsuccessful practice of physic, I have thought it incumbent on me to undertake the necessary, yet hazardous task. How great soever the sacrifice now made to the public good may be, I do not grudge it, for, in making such a sacrifice, I have done no more, as an honest man, than my duty; and must indeed have been unhappy, had any interested considerations tempted me to have left it undone.

Should,

Should, however, the advice given in the foregoing pages, be in any tolerable degree adopted, I shall have at least the pleasing consolation to reflect, *that I have contributed as much as any physician ever did in any age, to the health and happiness of mankind.*

✶ A Plate of the Apparatus was intended to have been prefixed to this Publication, but it has since been represented to me, that it would be unnecessary, on account of the frequent improvements that are making, and expected to be made upon it.

# FINIS.

*THE Aqua Salubris is, under my appointment, disposed of by Mrs. E. Newbery, the corner of St. Paul's Church-yard; Messrs. Shepperson and Reynolds, No. 137, Oxford-street; Mr. G. Burnett, No. 184, Strand; and Mr. W. Richardson, under the Royal Exchange.*

